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THE TREND OF HUMAN PROGRESS¹

By W J MCGEE

One summer noonday in early youth I approached the verge of the bluff-line overlooking the Mississippi midlength of its upper course, and for the first time looked down on the broad Father of Waters. Southward the shimmering surface stretched away between bordering bluffs with a belt of bottomland on the farther side, until it faded in the distance; northward it soon disappeared beyond a bold headland; but I already knew from the books and from the talk of my elders that it was a river. The sight was an inspiration, and left lasting impression. An hour afterward I was at the brink, vaguely disappointed to find the half-idealized thing of majesty nothing but muddy water lapping lazily against a crumbling beach. Recalling my preconception of the river, I scanned the breeze-troubled expanse to see which way the waters flowed; but in vain. Turning away, I saw a group of urchins lounging on a low lumber-pile, and, approaching in due awe of the superior wisdom and prowess of the city boy, I inquired of these long-time residents on the river bank

¹ Address of the President of the Anthropological Society of Washington, delivered before the Washington Academy of Sciences and affiliated societies, February 28, 1899.

which way the river ran. The voluble lad with feet nervously dangling from the edge of the lumber-pile answered promptly, "Huh! it don't run nowhere; it stays right there." His nearest companion, prone on stomach with chin in hands and heels wagging slowly in the air, answered more deliberately, "In high water it runs all over here." The chubby boy lying on his back with hat pulled over his eyes chimed in with the confidence of experience, "It runs agin the boat; jist you try it and see." Next the pallid youngster crouching on the farther corner of the corded boards piped up, "My father says it runs to St Louis," only to be suppressed by the ragged, red-haired urchin lying in a heap on the center of the pile with the ultimatum: "Hey? Well my dad says it runs right up yonder past Eagle Point to St Paul; and I reckon he knows!" Then the scientific inquiry was brought to a close by the more pertinent and important query in return, "Have ye ary white alleys?" But the lesson was not lost; I had learned how hard it is to find which way the current runs; I had learned, too, the worthlessness of the opinions of idlers.

Later I looked down on the stream of human experience with interest no less than that excited by the first sight of the Mississippi; I scanned the waves and eddies raised on the noble river by the breezes of conflicting opinion, and strove to separate them from the steady current below; and I inquired of the loiterers on the banks of this stream, no less hopefully than of the loafers on the long-ago lumber-pile on the Mississippi, as to the trend of the current. Not always have my guides agreed. When I asked of the past and future career of our planet, some held it to be slowly approaching the sun with a certainty of ultimate absorption in the fiery mass, while others considered it a slowly refrigerating body bound to lose its vitality neath a mantle of ice; I do not know which is right, and half suspect both guides to lack the experience needed to decide. When I first inquired the course of vegetal and animal life, I was met by the

confident declaration that there is no current—that the vital forms were fixed by fiat in the beginning to persist unchanged for ever and ever; later a red-skin man, full of the lore of his race, assured me that the animals of the long ago were vastly larger and wiser than the present pygmies, and that the future darkened toward annihilation; but afterward actual workers in experience of vitality mirrored that experience in their own minds, and pointed out a trend of vital development from the low toward the high, from dulness toward brightness, from mindless groveling toward intellectual uprightness. When I sought the current of human progress my earlier guides averred, with a conviction transcending experience, that man began little lower than the angels, and—save for an elect few—was lapsing toward the depths of eternal despair, or perchance drifting toward the annihilation awaiting the beasts in the dusky philosopher's gloomy faith; other guides were hopeful that those of their cult might possess the earth; but until within half a lifetime there were few who had the courage to stem the stream of experience with respect to man himself and learn the actual set of the current. The direction of flow of the Mississippi might have been learned from practical boatmen; and it is meet to inquire whether the trend of human progress may not be gained from actual workers in man's experience of Man.

The scientific study of Man grew out of research among lower organisms; and at first the lines and methods of inquiry in biology and anthropology were alike. Gradually the searcher perceived that the genus *Homo*, albeit animal, is something more. At first he feared his distinction was but a vestige of the classical division of the genus into the real species *sapiens* and the mythic species *brutus*, or else an echo of the medieval exaltation of spirituality, and so he touched lightly on those essential and fundamental features that demark man from his ancestral brutes no less strongly than these are demarked from the min-

eral substance of which their bodies are built; but prolonged experience forced the conviction that mankind must be viewed by the scientist, no less than by the idealist, as an essentially intellectual entity, and the possessor of social and moral characters reflecting the fundamental intellectuality. Next it came to be recognized that the unit of anthropology is not merely the individual body, as the animal body is the unit of zoölogy, but the social group, and this advance marked the birth of anthropology in its full sense; for the object-matter of the science is not so much man as men, not the somatikos so much as the ethnos and demos, not the person so much as the family, the clan, the tribe, the municipality, the state, the nation, the culture-group—indeed any assemblage, or all assemblages, of men. Now, the recognition of the essentially collective character of mankind was but the swinging of aberrant and idle opinion into the current of the stream of experience—for it is the function of science, the highest yet simplest form of knowledge, to resolve individual experiences into their true components and to bring ever-varying opinion into harmony with the invariable course of nature.

Recognizing the collective assemblage as the basis of his science, the anthropologist was nevertheless impressed by the variable structure of units constantly changing with birth and death of individuals, with migration and readjustment to new conditions, with the blending of groups and peoples, with discovery and invention; and he was soon led to see that the structure of the unit is less important than its activities—and thereby to raise his science to the plane of dynamic interpretation. True, he had the example of the other sciences before him, yet he pressed forward so rapidly as hardly to note their precedence until his passage was made; astronomy spent three millenniums in passing from astrology to formal description and thence to interpretation in terms of molar and molecular motion; chemistry dragged drearily from alchemy up to Avogadro and above before the physical basis of the science was fixed; biology rested in formal-

ism for centuries before Darwin established the ideas of generative forces and sequence ; even youthful geology has passed most of its history in formalism, and is only today emerging into the full light of interpretation in terms of agency ; while anthropology has occupied barely two decades in rising from the first recognition of the essentially human unit to the classification of mankind in terms of human activities—a period so short, indeed, that some have failed to keep pace with the advance.

Most of the makers of the modern science of man still live, some of them now listen ; it might seem invidious to offer them due meed of tribute ; but it cannot be held invidious, in this presence, to note that the Anthropological Society of Washington was the first institution to follow the epoch-marking advance and adopt an organization based on the primary activities of mankind.¹ In taking this step our members but synthesized experience covering a wider range than their predecessors enjoyed—the experience of long and intimate association between the white race, the red race, the black race, and some of the yellow race, as well as the unique experience of actual contact between the four grades of culture represented in savagery, barbarism, civilization, and enlightenment. So the tribute some of us would fain pay our progressive pioneers must be tempered by appreciation of the favorable conditions attending their pioneering ; for he whom fortune favors with experience of four races has a more than double advantage over the student of but two, while he who is favored with experience of four culture-grades has still greater advantage over the student of any lesser number, and he who scans at one view the field of four races and the series of four culture-grades sees the sum of human experience in single glance and, holding immeasurable advantage over the surveyor of narrower fields, might well blush to make no further advance.

¹ On January 17, 1899, the sectional organization of the Anthropological Society of Washington was reconstructed, and the number of sections increased from four to seven, viz. : *A*, Somatology ; *B*, Psychology ; *C*, Esthetology ; *D*, Technology ; *E*, Sociology ; *F*, Philology ; and *G*, Sophiology.

The founders and renovators of our Society have sought merely to conform the opinion expressed in their organic law to all recorded and remembered and inherited experience of men with respect to mankind. Their latest step is not their first pioneering; but should increased knowledge prove it ill-directed, it will be their first failure in defining and forecasting the rapidly growing Science of Man.

There are certain fundamental modes of arranging and interpreting the facts of nature which seem to arise in a certain order; they seem also to reflect the spontaneous operations of the human mind, and thus to embody the sum of human experience and epitomize the history of knowledge. (1) The simplest arrangement is numerical; it involves no acute or continuous observation, no discrimination save the most superficial, yet it easily expands so widely as to engage the full faculty of the student of nature in its external aspects; it matures in arithmetic, the earliest of the sciences and in some measure the foundation of all. (2) As the numerical arrangement is found too meager to express observed relations, an orderly arrangement in which relative position, or form, or size, or structure, or all of these combined, is superadded; this arrangement, or interpretation of relation in terms of space, involves increasingly acute observation and discrimination, and growing power of abstraction, but does not necessarily involve continuity in observation and ratiocination; it is expressed in the higher mathematics, in geography in its protean aspects, in all the descriptive sciences and aspects of science—its key-note is *graphos*. The two methods easily blend in that formal knowledge, or static interpretation, which marked the beginning of every branch of science. (3) As the numerical and formal experiences multiply into chaos, the mind spontaneously gathers its forces: observation is sharpened and prolonged, memory and reason are strengthened, experiences are sifted and synthesized intuitively, and at length the barrier to

advancing knowledge is leaped—and an arrangement or interpretation of things in terms of motions or powers is superadded in turn; then graphos becomes logos, observation is refined and grows into generalization, ratiocination is established, and the mind feels its power and begins the conquest of nature with the twin organs of hand and brain. (4) As knowledge grows, the numerical and formal and potential interpretations become too complex for convenient use; but it is an easy step from the arrangement in terms of motion to arrangement in terms of sequence, and this step has been taken in the several sciences in at least some of their aspects, including anthropology save in certain aspects—for while every anthropologist now recognizes the bestial ancestry of mankind, the increasing capacity of the cranium, and other features pertaining to the biotic development of the human body, there are some who have not yet been led to note the concomitant and much more significant demotic development of intellectual man. The third and fourth modes of arrangement of things easily unite in that dynamic interpretation which is the distinguishing feature of modern science, giving character to the New Astronomy, the New Chemistry, the modern biology vitalized by Darwin, the New Geology, and the anthropology of this Society. (5) There is another mode of interpretation, spontaneously yet only half-consciously essayed by many observers, in which the mind is held to be a reflex of nature, at once the product of experience and the guide to the invariable procession of events in nature; it is but the normal synthesis of the numerical, formal, potential, and sequential arrangements, and would seem, in combining these, to attain the acme in completeness of interpretation. It was formulated by Bacon as the key-note to his *Novum Organum*, the mentor of modern science, and after centuries of singular neglect has been reformulated and brought up to the present state of knowledge by one of our members in a new organon which time must test.

Regarding the successive modes of interpretation as stages in

the progress of knowledge, the position of anthropology in America, and especially in the Anthropological Society of the National Capital, is definitely fixed. We are long past the numerical stage in which the individual body is the unit, well past the formal stage in which organic and even superorganic structure marks finality, fairly advanced on the stage in which superorganic or collective activities form the bases of our work—so well advanced, indeed, that it is easy to forecast the transition from the merely potential interpretation to the sequential arrangement in which families and tribes and nations and cults and culture stages will be considered and classified genetically, as things that arise and pass like the plant, leaving ever the germs of new (and mostly better) organizations. The organization of the Society is well above the formal or static plane, well within the higher grade represented by the New-Science family; and it is the chief purpose of this writing to suggest the short and easy step from the potential interpretation embodied in our law to the sequential interpretation which must mark our next advance—unless the history of scientific progress is a delusion.

Recognizing the collective character of the human unit, and realizing that the human activities form the best basis for the classification of the human kind, it is but natural first to note and next to trace the growth of activital products, and then to note and trace the development of the activities themselves. No mind is too idle to note the shaping of the horseshoe under the hammer of the smith, and no thinking observer can resist passing to the skill of the smith and then to the growth of smithing itself, though he may be (indeed, commonly is) diverted before his mind has long followed its normal path. The idea of the collective unit may be likened to that of the iron and coal and tools, the material requisites for the making of the horseshoe; the idea of the potential factor may be likened to that of the smith and his fire, without whose work the iron and coal would avail

nothing; while the easily superadded idea of sequential development (which it is now sought to impress) may be likened to that of the progressive shaping of the horseshoe under successive blows, without which the heat and the sweat would avail nothing. It should be self-evident that motion involves progression, that there can be no dynamic action without sequence; if this be clear, the tracing of human progress is easy; if it be not clear, words are idle so far as the defining of human progress is concerned.

Recurring to the image of the breeze-rippled river, the volume of human experience of mankind may be likened to the lake-like body lying apparently inert save as troubled by the passing breeze of superficial opinion; or it may be likened to the real river whose current is quickly detected by the worker who stems or sounds the stream beneath the wavelets, and who must sooner or later learn which way the current sets—whether it runs down toward St Louis or up toward St Paul. Returning from the simile to the fact, it is easy—indeed but the normal and spontaneous action of the mind—to trace the trend of human development in terms of the human activities as now defined. True, the survey cannot be followed (save with the eye of faith) by those standing below the plane of dynamic interpretation—for none can justly judge the direction of movement save those who realize the fact that movement exists; but the fact that it is made from this new-gained eminence in the realm of science gives the survey a degree of accuracy not hitherto obtainable.

Let the survey of the course of human development be essayed in terms of the activital classification recently adopted in our law.

Somatology

The development of the somatikos, especially the osseous framework, was summarized by a master in the last presidential address before this Society.¹ This summary and other ethnic

¹ "Primitive Man," by Frank Baker; *American Anthropologist*, vol. XI, 1898, pp. 357-366.

records show that the human cranium has increased in capacity and changed in form from that of *Pithecanthropus erectus* to that of enlightened man; that the arms and hands have shortened and acquired greatly increased amplitude of movement; that the jaws have condensed from prognathic type to the human form; that the pelvis and leg bones have become better adapted to the erect attitude, while the opposable toe has lost its function—though even the most advanced skeletons retain vestiges of primitive character. Summarily, these changes represent a process of *cephalization*, discussed long ago by Dana as manifested chiefly by lower organisms, and more recently by Marsh as manifested chiefly by the higher vertebrates; but the student of human structure can go further and find easier way than the zoölogist, since the cephalization of mankind is incomparably more pronounced than that of the subhuman organisms. The average capacity of recent European crania is much above the average among the cave men of Europe; the skulls of modern dissecting rooms are decidedly better developed than those of ancient ossuaries; the crania of the Incas found by Pizarro appear to be persistently larger than those of the pre-Incan Peruvians; even in the history of America, to judge from the best portraits extant, the cranial conformation has changed from the retreating type of Washington and his contemporaries to the full-forehead type of the living statesman. The data are less complete than might be desired; but wheresoever there are measurements for comparison their testimony is consistent—they tell of progressive increase in cranial capacity among all peoples, with decrease among none. And the records show that cranial capacity is correlated with culture-grade so closely that the relative status of the peoples and nations of the earth may be stated as justly in terms of brain-size as in any other way—for while brain-structure would doubtless afford better criteria, the data are lacking. The most conspicuous fact of somatic development is cranial growth; yet the process of cephalization is manifested hardly less strikingly in the reduction

of prognathism, in the shortening of the fore-limbs, in the tendency toward diminution in number of teeth which dentists note, and in other characters of both skeleton and soft tissues.

Correlated with cephalization is a somewhat antithetic process, found only among mankind, which may be called *cheirization*. It is the process involved in manual training, both subconscious and purposive; its mechanism appears in the wide range of action in the human hand as compared with the paw of the animal, and no less strikingly in the increasing range in manual capacity found in ascending the scale of human development from savagery to enlightenment; its effects are displayed in the better development of the forearm among white men than among yellow or black men; and its prevalence is shown in the hundred manifestations of manual dexterity among cultivated men to each half-dozen found among primitive men. Yet the process is not limited to the hand; it is expressed also in that mobility of countenance and modulation of voice and eloquence of eye that distinguish the civilian from the savage stoic (so called because his poor heritage does not embrace that refinement of bodily function enjoyed by the higher of his kind); it is expressed incidentally in robustitude of limbs and sensitiveness of skin to touch and temperature—for it is the reciprocal of concentration, and stands for peripheral development in its various aspects. It is expressed more emphatically than in any other way in the motions to which all human activities are reducible, especially in the centrifugal (or outward) motions normal to higher culture in contrast with the centripetal (or inward) movements normal to primitive men. The yellow or red or black artisan draws his cutting tool toward his body, the white artisan pushes knife and saw and plane outward; the primitive weapon is hooked, the more advanced weapon curved outward, and the javelin and boomerang and bow mark great advance along the way toward the aimed projectile; the lower fighter clinches, the higher pugilist strikes and parries; the less cultured scribe writes from the

right, the more cultured toward the right; the plodding coolie plants his feet in the line of his path, the high-bred mandarin turns his toes outward at right angles to his front; the clumsy cook wipes the dish toward her and often drops the crockery, the deft dishwasher wipes outward and can be trusted with costly china; the self-centered subject swills his soup from bowl tipped toward him, the out-seeing sovereign and citizen instinctively tip the soup-plate outward—in short the way of progress is from the egocentric to the open and free in manual motion as in cerebral action. It is true that few of the data of cheirization are in the books; but they overflow the poor work-sites of savage skin-dressers and ancient arrow-makers, the simple laboratories of barbaric stone-workers and semi-barbaric smiths, the mines and mills of civilization, and the elaborate manufactories of enlightenment—they are far too voluminous for books, yet within constant sight of all whose eyes are open.

While cephalization and cheirization stand out among the factors of somatic development, they are little more than charts to that highroad of human progress which lies in *coordination*—the conjuncture of hand and brain, or more exactly of the initiative and directive faculties. Expressed summarily, the somatikos includes the osseous framework, the alimentary and respiratory and circulatory systems by which internal relations are maintained, the muscular system by which external relations are developed and extended, and the dermal system by which the structure is protected; and over against these the neural system, culminating in the brain, by which both internal and external relations are regulated. Now, somatic progress might be measured, were the means of measurement available, by the advance in neural structure and function found invariably in passing from infancy to maturity, from the lower races to the higher, from the earlier culture-grades to the later, and in each race and grade from the human flotsam to the leaders of their kind; with this advance the capacity for pleasure and pain grows acute from the

dull savage to the vivacious civilian, yet the aggregate of pleasure always exceeds the total of pain, so that smiles and laughter and music and poesy grow up while the dark faith of Moloch yields to optimistic light—save in the sporadic Jeremiah whose bodily generations have apparently outrun the cerebral growth of his stock.

Somatic coördination is expressed in that combination of neural and manual capacities sometimes called *faculty*. It is matter of common observation that the white man can *do* more and better than the yellow, the yellow man more and better than the red or black; and the record of handiwork found in the archeology of the world tells that faculty has grown steadily from age to age, while the written records of industrial history prove increasingly rapid development of faculty from generation to generation among the peoples of the world. A part of the improvement may indeed be ascribed to augmented knowledge (itself the highest expression of coördination), yet only a part can be so explained; for those who know the races realize that the average white man is stronger of limb, fleetier of foot, clearer of eye, and far more enduring of body under stress of labor and hardship than the average yellow or red or black—despite the special proficiency along a few narrow lines sometimes displayed by the lower type and drawn large in travelers' tales. So, too, those who trace the generations through history realize that the later are stronger than the earlier; Rollin perpetuates the staggering records of Milo the Champion and other marvels of the classic arena, yet the witnessed feats of Milo are outdone by living Sandow, while American athletes defeat the descendants of gladiators on their own ground; the average Briton or American is too big for the armor of the mail-clad hero of medieval history; the rough-riding scion of enlightenment appals by his superior stature the puny soldiery of unprogressive monarchism; it is a poor modern year that does not mark the breaking of one or more world-records in athletics; and the citizen artisan habitually

keeps up with a machine geared so high that the subject workman loses one stroke in six.

Another expression of coördination is found in that progressive vigor and viability vaguely connoted by the term *constitution*. The practitioner among different races knows that while the primitive man may suffer less than his civilized brother from a slight wound or illness, he possesses little recuperative power and dies of injuries or disorders from which the Caucasian would easily recover; comparison of the longevity tables of Pompeii, of Europe early in the century, and of modern actuaries, shows a progressive increase of nearly a decade in the average expectation of life; and the same story is told in more commonplace yet infinitely more emphatic terms by the steady increase in population of the world, an increase wrought chiefly by the two higher races and the two higher culture-grades—especially the Caucasian race, and (during recent decades) the budded enlightenment of Britain and full-blown enlightenment of America.

In brief, the witnesses of somatic development from race to race, from antiquity to modernity, and from generation to generation are many and in the main consistent; the skull has risen from the simian type, the skeleton has become more upright and better adjusted to brain-led activities, the muscles have gained and are still gaining in efficiency if not in absolute strength, the faculty for work (or normal exercise of function) is multiplied, the constitution is improved in vigor, life has grown longer and easier, and perfected man is overspreading the world. There are indeed isolated experiences suggesting human degradation, and these are flaunted by those prophets of evil whose lamentations are always loudest and longest continued; but when all available experiences and records of experience are brought together fairly, only a single general trend can be traced—the trend toward better physique and greater strength. The forecast for the future based on the sum of human experience is bright; for the current of human progress wells upward as the river flows down

toward the sea, and none can look forward and downward without forgetting the current of experience behind.

Biology and anthropology touch in the somatikos, which is held by both to be the product of organic development during eons past; yet one of the most patent facts of the organic world is the broad gap between man and the lower animals. True, the human skeleton so closely conforms to that of the apes that, according to Gill and others, no link was lacking even before the finding of *Pithecanthropus*; true, most of the muscles and tendons of man and the higher apes are homologous, while man retains vestigial structures manifestly inherited from simian ancestors; yet the great fact remains that even the lowest savage known to experience is human in attitude, mien, habits, and intelligence, while even the highest apes are but bristly beasts. It were bootless to deny or decry the chasm separating the always human biped from the always bestial quadruped, since the chasm is the broadest in the whole domain of nature as seen by those who appreciate humanity in its fulness—it were better to face the chasm fairly and seek to bridge it squarely.

In attempting to define what may be called the *humanization* of the bimane, it is necessary to again question whether the extension of essentially biotic laws into anthropology has not been overdone. One of these is the law of the survival of the fittest, which indeed holds (within limits) for human activities and products, yet seems not to hold for man himself, who strives to reform rather than exterminate the weakly and the wicked; another is the biotic law of sexual selection, which can hardly hold in an assemblage of organisms all normally mating and leaving progeny, practically regardless of personal beauty or habit of mind—indeed it would appear that, in those communities in which the predominance of either sex renders a test possible, the most attractive individuals of the predominant sex are, on the average, the last mated and the least prolific. The apparent fail-

ure of these laws of lower life has led to the inquiry, by Powell and others, whether they are not annulled by higher laws pertaining to the genus *Homo* in his demotic attributes. The inquiry is made pertinent when certain human characters which manifestly reflect demotic functions are noted—e. g., the organs of speech, which are highly differentiated among the better races and in the more advanced culture-grades, much cruder in the lower races and in primitive culture, and but rudimentary in sub-human animals. The inquirer soon finds a clue in the specific modification of hands, fingers, arms, and other organs connected with special occupations, particularly when hereditary, for the numberless facts of such experience show that the *somatikos* is susceptible of reshapement through exercise—and the suggestion has been actually applied by intelligent leaders of gymnasia who habitually reshape the bodies of their pupils to their liking by carefully devised courses of exercise. These and other experiences seem to show that *the reconstructive forces in effect since man became human are the demotic activities*, and that *the efficiency of these forces in the reconstruction of the somatikos is proportional to the intensity of the activity at the time of action*. The blacksmith develops muscle and bone, not in sleep or noonday idleness, not even in waiting by the forge for the iron to heat, but in the actual exercise of forging, and, in some obscure way, the frequent alternation between vigorous effort and complete rest harmonizes with the rhythm of the organism and renders the exercise peculiarly constructive; so, too, the soldier coördinates body and mind and attains his peculiar powers, not by resting or reading tactics, but by supreme action, the action first of simulated and then of real strife. It is the lesson of experience—even though quantitative data are lacking—that the efficiency of the human activities increases in more than an arithmetic ratio with the intensity of the action: the poem written in an hour may consume the stored-up energy of a month, the noble painting is the product of inspiration, the great invention is the

creature of a psychologic moment, while the career of a lifetime is shaped by a few critical hours or days; and it seems equally certain, once attention is directed to the subject, that the course of demotic modification of the human organism is to be traced in the succession of critical instants of supreme intensity in action and passion. The canyon-cutting river ripples idly over its bed without carving a line during the eleven months of low water, and then saws through a foot of rock during the month of freshet; and so the stream of human activity ripples merrily but idly until crises compel the action by which the mind is molded and the body shaped—when conation becomes the key-note of progress, as our associate Ward has shown.

With due appreciation of the paramount role of concentrated intensity of action in shaping the course of human development, it seems possible to explain, at least provisionally, the apparently sudden and complete transformation of man as he left the plane of the brute, and his continued and increasingly rapid development on the higher plane. The differences between man and ape which appeal to all observers (save those whose trained vision is fixed on structural homologies alone) are too many for easy reckoning; they include the erect attitude, the practically hairless skin save where a more luxuriant pilary coat serves esthetic function, the expressive countenance susceptible alike of smiles and tears, the tool-using hand, and above all else the peculiar intelligence enlivening the visage and directing the hand—attributes which indeed find their germ among lower animals, yet attain full development only in the highest of the series. For convenience, these and other attributes may be combined in somewhat general categories, (1) the erect attitude, (2) personal comeliness, (3) manual delicacy, and (4) capacity for intellectual choice of associates and mates.

Now, the distinctive characters of *Pithecanthropus*, erect yet almost simian in size and form of skull (and so marking a critical stage in development), support a previous view that the upright

attitude must have been the earliest of the specifically human attributes in order of development, since it is essentially biotic while the others seem to be demotic and traceable to its influence. Accordingly the progenitors of human kind must have associated face to face and hand to hand, and developed—howsoever unconsciously and crudely—ideals of comeliness based on stature and facial feature and gesture; and, for the first time in the history of the world, the supremely intense effort of vitality to perpetuate its own stream was marked by full sight of the transfigured face of the mate, with eye speaking to eye and voice to voice in eloquent expression of intellectual choice. Such may well have been the real beginning of humanization; and from the beginning it has seldom been the average beings who have begotten progeny, but the momentarily inspired—yea, glorified—pair whose excellences of manhood and womanhood are caught in mutual apotheosis to be carried up the stream of life and made better with each succeeding generation. If the ideals of a physiologic moment be perpetuated, as Moses taught, and as most primitive tribes believe, then Goethe dreamed wiser than he knew of the elective affinities, and the modern student may bridge the broad break between beast and man—may explain the quick-grown comeliness of his kind even unto the elimination of bestial bristles and dermal pigments, may understand the exaltation of love, the rise and ramifications of romance through song and story, and the development of the strongest collective ties; yet, whether he adopt the interpretation or not, he cannot gainsay the great facts of human progress conjoined by the hypothesis.

A conspicuous though much neglected fact in the somatic development of mankind is hybridization, or rather *consanguinization*, whereby tribal and racial boundaries are constantly broken down. Among most primitive peoples intertribal mating is regulated by surprisingly comprehensive laws, which commonly prohibit intermarriage within certain groups and without certain

larger groups—though few neighboring tribes are so inimical as to prevent occasional intermarriage, perhaps through war or enslavement; so that there is a constant and, on the whole, fairly rapid intermingling of blood among the savages and barbarians of every continent or larger province. Among advanced nations, especially in that enlightenment in which individual action is largely freed of conventional barriers, international and even interracial mating is still more common. So it is not too much to say that the streams of the blood of the world are converging, if not uniting—a fact that must be accepted as a condition, howsoever repellent as a theory.

It is not easy to measure the consequences of the blending of blood, since the testimony is hardly consistent; on the whole, it would seem that intertribal and international blending is beneficial physically as well as socially, but that interracial union is often apparently injurious, generally of doubtful effect, only rarely of unquestionable benefit. It is a great fact, recorded in the entire literature of history, that the predominant peoples of the world are of mixed blood, and that generally the degree of predominance seems to be measured by the extent of the intermixture; nor can it be forgotten that the blending of the white and the red has produced some of the finest specimens of humanity the world has seen, including one of the world's foremost leaders, the President of our neighboring republic; or that the mixture of white and black has produced a Frederick Douglass, a Booker T. Washington, a Blanche K. Bruce, a Paul Laurence Dunbar, and other makers of progress in the most progressive nation. By far the greater part of the interracial matings have been illicit, and between the lower specimens of one or both lines of blood, so that the evil of miscegenation may well have been intensified; and this fact enhances the interest of dispassionate students in the results of legal matings, and especially in those of the eminent Othellos and dignified Desdemonas domiciled in our national capital and scattered throughout the country.

The sum of experience concerning the blending of human blood is easily stated. No tribes, or races, or nations are drifting apart in blood, none have drifted apart (if such a process be possible) during any period recorded in history, while all are now either running parallel or converging and uniting—in other words, the blood distinction of the world is steadily diminishing, and is less today than ever before since the beginning of history or interpretable prehistoric record.

The prominent facts of cranial size and structure revealed in the pithecanthropoid and higher types, and the hardly less conspicuous fact of reshaping of hands and other organs through exercise in the essentially human activities, shed some light on the features and functions of the human prototype, and so on the earliest steps of human progress, the testimony of *Pithecanthropus* being peculiarly significant. Viewed collectively, the great facts seem to indicate that the transformation began with the assumption of the erect attitude, and advanced with cumulative rapidity as the processes of cephalization and cheirization went forward. Now, the erect attitude itself suggests maturing differentiation between the locomotor and prehensile organs, coupled with definite concentration of function in the two pairs of differentiated limbs; while the skull-molding and hand-shaping activities necessarily attending the erect attitude betoken a degree of anterior development hardly consistent with the retention of diverse posterior organs for locomotion and prehension combined (indeed the human body is characterized by relative smallness of the lumbar ganglionic complex, scarcely less than by relative largeness of the brain-case); so that the several lines of structural facts seem to point to a tailless ancestry, not merely at the critical stage but throughout eons of antecedent progress. These phylogenetic indications emphasize the obvious outward differences between existing quadrumanes and men, and at the same time explain the absence of living links between the simian or

pithecoïd and the human types; for they warrant the inference that the lines of ascent diverged somewhere below the plane represented by the modern simian. If this inference be correct, it would follow that the representatives of the human line must have either fallen in the transitional struggle or risen well into the ennobled type in long-past ages, not yet noted in the chronology of any continent or clearly fixed in the scale of paleontology. The inference and its corollary are in line with the conspicuous facts of both human and animal realms; for the law of humanity is convergence in blood and brain to a degree overshadowing environment, and the law of animality is divergence into varieties and species and genera adapted to environment, while no trustworthy observation suggests that even the highest apes can blend with even the lowest savages—they may be domesticated and indeed artificialized in some measure (though less completely than horse and dog, so far as the records go), yet there is no real interchange of culture—much less of blood—such as characterizes the human realm.

The testimony of function-shaped structures concerning the infancy of the race is extended by that of various vestigial functions and structures; these are especially conspicuous in tree-climbing tribes, yet hardly less notable in early infancy among advanced peoples. According to Hilder, the Tagbanua tribesman of the Philippines is almost quadrumanous; the hallux is nearly as completely opposable as the pollex, a knife or pin is readily picked up with the foot, while, in climbing, branches are grasped with the toes so firmly as to support the weight of the body; the average Caucasian infant shares character with the Tagbanua and the bestial quadrumane to the extent of measurably opposable hallux and prehensile feet; and when the hereditary pedal power is perpetuated by exercise, as in Unthan, the armless German (who is a fine marksman and fair penman despite his infirmity, and who uses knife and fork, or cigar and match, or comb and brush, with no less dexterity and delicacy than other

well-bred men), the feet retain their vestigial deftness throughout life. Coupled with these limb functions are certain special structures, like the scansorius muscles of the quadrumanes which commonly persist in form if not in function among bimanues; and special functions of normally functionless structures, like the auricular muscles which retain the useless power of moving the ears in many infants and occasional adults, as described by Darwin. Especially significant is the ability of the new-born babe to suspend itself by hands and arms for considerable periods; for this marvelous persistence of a function weakened by desuetude during a thousand generations unquestionably tells of adjustment to an aberrant (not to say unnatural) environmental condition by survival throughout a vast period. These and other vestigial indications are parallel in direction; the pedal power of infantile men and races points to a tree-climbing ancestry; the voluntary mobility and delicacy of the ears point to a woodland habitat in which these organs were the chief detectors of danger, the subtlest bond between the individual and the great external, as among certain arboreal monkeys of South America and other provinces; while the hereditary prehensile faculty of infancy seems to demonstrate a strictly arboreal habit pursued from the instant of birth to the end of life.

The evidence of somatic structures and the indications of vestigial features are still further extended by the testimony of nascent activities shared by the higher quadrumanes and men: The gorilla wields a club and the baboon carries a cane, while the Liberian monkeys, according to Cook, use sticks and stones as implements and weapons combined; similarly the presumably autochthonous Seri Indians use pieces of wood and stone picked up at random, as well as shells, fish-spines, cactus thorns, teeth and bones of animals, and the silicious epidermis of the cane, in their simple industries, the objects of more obdurate material remaining unwrought save as shaped in use; while the simplest artifacts known to archeology consist largely of tooth, bone, shell,

and other substances suggesting riparian or maritime habitat. In somewhat more advanced culture, as shown by Cushing, wood and clay were shaped in similitude of these natural objects under a persistent system of symbolism, at once recording an early shoreland influence and explaining the strong tendency of primitive peoples to deify seas and streams and perpetuate other notions implanted by the waterside. The evidence of budding demotic function, especially in America and eastern Asia, is in line with the obvious fact that shores abounding in sea-food afford the simplest and easiest livelihood for humans of the lowest culture, and that they are the natural lines of migration under the pressure of the food-quest, as shown by Mason; while it is the commonplace experience of both primitive and cultured hunters that the stream-diversified woodland—yielding fish, flesh, fowl, and fruit, constituting an easily-memorized natural map, and affording natural ways of travel—is the environment best adapted to life when the appliances of higher culture fail. The leading facts of initial activities, of the localities of easiest livelihood, and of the lines of easiest travel are in harmony; they indicate that the earliest men were not only arboreal in habit but orarian in habitat.

So it would appear that while the body of recorded experience relating to primitive man is too limited to warrant final judgment concerning the origin and early development of the human genus, it is sufficient to suggest that the prototype was a tailless quadruped inhabiting coastwise or river-watered forests. True, there are some indications that in certain provinces man became troglodyte or mountaineer while yet in primal state; but there are still stronger indications that, whether the cave-dwellers were autochthonous or not, most modern men must be regarded as wanderers from the natural Eden of a wooded shoreland.

Summarily, the trend of somatic progress is clear, despite the mists beclouding the earliest stages: No experience tells of

structural or functional differentiation save such as reflects brain-led activities, themselves coalescing with the confluence of culture; all experience tells of slight but steady remolding of the body through exercise and inspiration's spur, of steadily improving coördination of hand and brain, of the elimination of race distinctions through blood-blending. When the entire field of man's experience of physical man is surveyed, it becomes clear that the human genus is not dividing into species, as the bestial genus divides, but is steadily drifting toward unity of blood and equality of culture. It seems safe to project the lines of experience of somatic progress a little way into the future and a longer way into the past; projected futureward, they converge in consanguineal union transcending tribal and racial distinctions; projected backward, they divaricate to an indefinite number of confluent currents coming up from proto-human sources to successively merge in the great stream of living humanity—a stream traceable by all who pause to note commonplace facts of everyday observation.

Psychology

It is postulated in this writing that, as taught by Darwin, organisms are molded by interaction between their own bodies and their environment, and that the effect of the interaction is perpetuated and made more definite from generation to generation; it is postulated also that, as taught by Spencer, organized bodies are composed of highly differentiated terrestrial substances combined in such manner as to perpetuate themselves through the continued maintenance of internal and external relations; it is postulated further that the organization of living bodies is hierarchic, the organs of most highly differentiated substance dominating the organs of less differentiated substance, and the degree of differentiation and domination increasing from simple tissue to nerves and ganglia and culminating in the brain; it is still further postulated that, as recognized for a half-century, the brain is the organ of the mind, and that its function is the conservation and

creation of intelligence ; it is finally postulated that, as taught by Bacon and reaffirmed by Powell, the mind is a reflex of nature, more or less perfect according to the directness or indirectness of its contact with nature.¹ From these postulates and from the observed facts of somatic development, it is inferred that the human brain, and so the human mind, are capable of progressive development through appropriate exercise ; and from the postulates and the observed facts of demotic (or activital) development, it is inferred that the human mind is capable of progressively increasing its own control over the human body-substance, and of progressively extending conquest over other materials and powers of nature through the media of muscles and machines. Whether the postulates and inferences be accepted or not, the great facts of psychic development throughout the world cannot be gainsaid ; yet acceptance would make easier the understanding of psychic progress.

The most conspicuous fact of psychic development—one noted subconsciously or consciously by every intelligent being—is found in the normal persistence and augmentation of knowledge. Units of substance may be conveyed or exchanged, but when once transferred they are gone ; units of power may be transferred, but always appear to be lost on the one hand as they are gained on the other ; while units of knowledge may be transferred indefinitely from party to party, yet no party loses though all may gain. This great fact may seem trite ; certainly it is the commonest of commonplaces in human experiences ; yet, on serious thought, it must be regarded either as a meaningless paradox or as a peculiarly meaningful expression of law. Some of the attendant conditions are worthy of note. It has been known for centuries that the teacher may convey given knowledge, with more or less loss according to his skill or lack of skill, to each of five or fifty or five hundred pupils without surrendering an iota

¹ Compare "The Foundation of Science" ; *The Forum*, vol. xxvii, 1899, pp. 168-178.

of his original stock, and indeed with some gain to himself; it was long ago observed, too, that in time the scholastic teacher becomes stale, loses mental elasticity, and must be superannuated or discarded; while much recent experience indicates that the teacher of nature finds his theme an inexhaustible well-spring of knowledge and continues to acquire and impart the facts of nature with little loss of efficiency, and indeed with certain gain, until senility settles on the faculties of body and brain at once. These and many other experiences verify the marvelous prevision of Bacon, and go far toward proving that the mind, with its wealth of inherited and acquired knowledge, is but the product of interaction between its own hierarchy of organs and the great external; at the same time they remove an apparent obstacle in the way of considering mental power as indefinitely extensible with the progressive growth of its own proper organ and the ancillary organs of the human body. Accordingly it would seem timely and profitable to recognize a law of mind, comparable with certain other fundamental laws which have been incorporated into the body of science; one of these is the law of indestructibility of matter; another is the law of conservation of energy, or "persistence of motion" if the latest formula be adopted; that which is now enounced is the *law of cumulation of mind*. The summation of experience expressed in this formula of mentality is comprehensive; under postulates which seem axiomatic, it is in accord with the prehistoric development of protohuman and human crania, with the beautification of the human body, with the reconstruction of the primitive somatikos by demotic interaction, and with cephalization and cheirization in their multifarious aspects, as well as with the purely intellectual development of mankind. The reduction of the formula to quantitative terms is a task for the future.

The current of human experience with respect to the progress of the human mind is strong and unmistakable; mental power is increasing with the multiplication of interactions, and, like the

strength of ancient Anteus, is constantly renewed by contact with nature; the knowledge in which the power is stored up is never lost save in the extinction of entire groups or in the death of the recluse, the robber of his kind, but is only brightened and purified and multiplied by exchange and carried forward by the generations of men with cumulative rapidity; and as the generations arise and mingle and pass away, this noblest of heritages increases and spreads from tribe to tribe, from nation to nation, and from continent to continent, ever unifying mankind, ever dominating lower nature.

The postulates concerning the organs and functions of mind seem to elucidate a much mooted problem in ethnology: Many investigators have been impressed by the similarity in mental operations displayed by unrelated peoples, perhaps inhabiting separate continents, and have been led thereby to infer that the peoples were of common ancestry; Israelite and Indian, Egyptian and Yucatecan, Polynesian and Peruvian, Malayan and Mexican, have more than once been combined on the supposed evidence offered by similarities in activital products or in the activities themselves; world-wide symbols like the swastika have been held to establish the genetic unity of the human genus; and through subconscious ratiocination nearly all thinkers have integrated their experiences, howsoever limited, into an intuitive hypothesis that all men sprang from a single pair. During two decades expert anthropologists have been engaged in rectifying the real and assumed data for this hypothesis; Powell began by explaining the origin of activital similarities (or activital coincidences); Brinton and others have insisted that any two minds must be expected to respond similarly to similar stimuli; British anthropologists half deride and half accept this teaching as the "American Monroe doctrine of anthropology"; while different students have tacitly or openly accepted the view that minds, wheresoever placed, must develop along essentially parallel or converging

lines. By some, the uniformity of mental action has been deemed mystical or extranatural, just as every striking manifestation of nature is deemed mystical in pre-scientific culture; yet the mystical view would seem unnecessary and no less misleading in this case than in others.

In brief, just as the organic body must (under the primary postulates already outlined) be regarded as an assemblage of substances and powers reflecting the interactions of ancestral organic existence, so (under the same postulates) the mind organ can be regarded only as an assemblage of substances and powers epitomizing all ancestral interactions between itself and the rest of the somatikos, and between the somatikos and the great external. It follows that, just as any two organisms of the same species are like in physiologic process and in response to external stimuli, so any two brains of equal faculty must function alike or so nearly alike as the environments by which their final shaping was given. Accordingly, the much-mooted unity of the human mind would appear to be nothing more than a manifestation of cerebral homology (itself the record of eons of organic development) perfected during the final eon of demotic progress.

It is significant that the more striking activital coincidences (such as the independent development of corresponding calendar systems on opposite hemispheres) exemplify like response to like stimuli by minds approximately equal in culture status; the well observed cases by no means exemplify like response to unlike stimuli, as might be anticipated if mental faculty were either (1) extranatural in origin or (2) derived from a single original source; so that, on the whole, the recorded examples of uniformity in intellectual action seem to point toward a natural and spontaneous development of mental faculty in full accord with environing conditions—a course of development caught by Bacon, albeit in narrower range, three centuries ago.

While so conspicuous as to challenge attention (in accordance

with the law under which observation begins with the unusual), the activital coincidences among diverse peoples are much less common and persistent than those differences in mode of thinking which form the strongest bar against union of tribes and nations. It is a commonplace of observation that aliens can intermarry more easily than live together in harmony (save where one is able to extinguish the discord by overpowering tone); it is a commonplace of history that nations war ten times over differences in faith, or faith-inspired conduct, to each battle over realities; and when tribes, either in natural condition or grouped on reservations, engage in strife, the source is almost invariably traceable to diversities of belief or language or law, that is, to mode of thinking. So, too, the most serious obstacles encountered by ethnologic students and missionaries are fundamental differences in the way of viewing things which hold them apart from their alien co-laborers; and when the lower thinker adopts a higher faith, it is long a lightly-worn veil, to be cast aside in times of stress, before the new woof is fully woven into his web of thought through fixed habit or heritage. By superficial observers these persistent diversities in mental operation are sometimes ascribed to difference in race; but deeper study indicates that they reflect habitual activities, and are thus demotic rather than biotic, the expression of brain rather than blood, the mark of culture rather than color.

Incongruities in mode of thinking form a social factor of no small moment among higher as well as lower peoples: The European statesman constantly stands guard against misunderstandings growing out of local habits of thought and colloquial forms of speech; even the American nation has more than once met threat of disruption merely because citizens of different sections failed to understand each other's motives; and the chief obstacles to international alliances grow out of provincial prejudices, which are only slowly—albeit steadily—disappearing with the unification of knowledge by means of travel, telegraphy, tele-

phony, and the immeasurable influence of ephemeral press and more permanent literature. The diversity in intellectual action among different peoples is well displayed in that most spontaneous form of thought, humor. Probably no race is able to appreciate the humor of any other race; but it is equally true that no people readily assimilates the humor of another people, whether of the same race or not: The Englishman chuckles at *Punch* and glowers at *Life*, while the American groans over the former journal and grows hilarious over the latter; even the Scot chaffed by the Englishman over the need for hammer and chisel to get a joke into his head retorts aptly, "No doubt you are referring to an English joke." Indeed, when any two peoples can freely exchange quips and jests and *jeux d'esprit* they are ready to adopt the same body of law, whatever their differences in material interests or in hue or skin. The philosopher (whose name is legion), caring not who writes the laws for a people so long as he writes their songs, grasps a great fact in human nature; for deliberate thought is always more closely attuned than the spontaneous upbubbling of lighter vein. And one of the significant signs of the times is the increase and diffusion of light literature serving to obliterate sectionalism and bind ever-widening circles of thinkers with cement of sympathy.

On analyzing the incongruities in mode of thinking displayed by diverse peoples, it would appear that some (especially those of more superficial character) are traceable to environment; for, other things equal, the mental operations of peoples vary with their surroundings. At the same time it would appear that a greater part of the incongruities (especially those of more fundamental character) are traceable to culture status; for, other things equal, peoples rise above environment in a degree proportionate to the quantity and kind of their knowledge—when their modes of thinking tend to become uniform under the general law of activital coincidence. Accordingly, thinking might be classified in terms of environment; but it may be much more compre-

hensively and usefully seriated in terms of culture-grade. Now, the principal stages in cultural development have already been defined as (1) *prescriptorial* and (2) *scriptorial*; these stages corresponding approximately with stages in social development commonly defined as (1) tribal and (2) national. More extended comparison indicates that both culture-stages may advantageously be subdivided; and the entire series may be outlined as follows:

1. The earliest culture-stage defined by mode of thinking is necessarily obscure, since primeval man no longer exists, and since his characteristics survive only in vestigial form, chiefly in linguistic and esthetic symbols and in minor features of mythology. According to Hewitt and others, the linguistic vestiges indicate that primeval man used a distinctively pronominal speech, supplemented by pantomime; according to Cushing, the esthetic vestiges suggest that primeval thinkers were dominated by ideas of personality, such as were recognized by Humboldt, Brinton, and others; moreover, there are many indications that early men were given to personifying and even deifying a vast range of impersonal entities, so that the most primitive mythology is burdened with a mass of reified and deified entities which it is the function of later culture to eliminate or concentrate. The several lines of evidence indicate that the primeval thinker was controlled and habitually appalled (like the shy and timorous beasts passing into intelligence through the hard way of cunning) by half-realized entities, that his world was one of abounding objects often idealized into intensified objectivity, and that he thought largely in terms of the abounding things designated by his pronouns and natural gestures. This stage in thought may provisionally be called *pronominalive*.

2. The next developmental stage is well illustrated by various primitive peoples now living, e. g., the American natives. In this stage objectivity yields gradually to relativity, and the modes of thought and expression are essentially associative; the language is holophrastic and connotive; the esthetic motives are symbolic,

with a strong tendency toward conventionality; the mythology embraces a hierarchic pantheon in which the deities and their bestial or human vicars hold definite place, sometimes fixed by a cult of the Quarters; the social organization is maintained by reckoning from the ego, and often memorized by placement of individuals in the family and of families in the tribe. The prevailing habit of thought is egocentric, in that the cosmos is classified with respect to the ego (which is so amplified as to involve elements not only of person but of place, of time, and of action); but, since the dominant idea is that of relation between self and other entities, it may better be characterized as *associative*.

These two stages combine to form the general stage of pre-scriptorial culture, in which thought is shaped and conveyed chiefly by oral symbols, with some aid from gesture and graphic symbolism, and is measurably crystallized and perpetuated by means of tradition. The shadowy pronominal method seems to pass naturally into the associative mode of thinking, which persists in turn until the volume of knowledge becomes so great as to overload the increasingly complex system, when an arrangement better adapted to a larger body of knowledge arises spontaneously.

3. In the third stage the hand supplements the tongue, and the oral symbols are duplicated in manual symbols in such fashion that writing and other graphic devices replace tradition and relieve memory of its greatest burden; at the same time the objective terminology, at first pronominal and then connotive, gradually becomes denotive, while pantomimic and other actional devices are replaced by verbs and cognate oral and graphic action-symbols; at the same time, too, associative inflectional forms drop into desuetude, while the simplification of language is doubly accelerated through the addition of hand-economy to tongue-economy. The advance in speech, albeit notable, would seem but to reflect a stimulated cheirization and an improved coördination marking growth in self-consciousness of power and in effort to subjugate nature; the key-note of the stage is action

—the verb in language, outward movement of limbs, vigorous extension of thought. With the coördination of hand and tongue, perfected by exercise in graphic construction, cheirization is stimulated, and limb and brain come into closer coöperation to the further strengthening of both organs; and, with the stimulation of the sense organs brought into play through the coöperation, impersonal relations are perceived, analyzed, and gradually systematized. As the perception of relation proceeds, the lowly egocentric system becomes ethnocentric and then democentric, while among the more learned a geocentric cosmology arises and gives place slowly to a heliocentric system; at the same time perspective appears in art, and a refined spirituality in faith. As the perception of relation extends to individuals and their activital products, the concept of property-right crystallizes; then the relation between individuals and their habitat is perceived, and the concept of territorial right arises to mature in a new order of thinking. In its most general aspect, the thinking of this stage may be defined as *coördinative*.

4. As manual activity bears fruit in mechanical devices a fourth stage of thinking, in which thought-symbols are multiplied and perpetuated by mechanical devices, grows definite. Machines replace unaided hands, printing replaces writing, and semi-symbolic conventionism declines in art as mechanically faithful portraiture betrays its weakness; and in every stage the mode of expression reacts on the way of thinking. As the habit of action grows, and as the relations of things in nature are perceived with increasing clearness, inherent forces are controlled with ever-growing success; the brain prompts and the hand responds, and each full response gives birth to new impulses; and, as faculty develops through exercise, the passive coördination of perceiving relation rises into the active coördination of regulating relation. The modes of thinking in this stage are multifarious and complex, and perhaps too near at hand for just definition; but they may be characterized provisionally as *inventive*.

The coördinative and inventive modes of thinking give character to scriptorial culture ; yet there would seem to be a measurably distinct stage now arising in the highest culture—a stage in which knowledge is instantaneously diffused over the earth by the telegraph, in which the human voice sounds over the continents through the telephone, and in which various devices for the annihilation of space and time are reacting on thought in such manner as to unify the thinking of all humanity. It is becoming evident, too, that the coördination of thought by means of devices whereby brain is brought in contact with brain throughout the world (as suggested by intercontinental telegraphic chess games) produces a constructive coöperation between widely separated thinkers, somewhat akin to that of individual hand and brain, and thus shapes a collective and superorganic mechanism for the making of knowledge by the conjoined efforts of many workers. This immature stage seems to be essentially *creative*.

In brief, the culture-stages may be outlined as (*A*) prescriptorial or receptive, comprising (1) pronominal and (2) associative thinking ; (*B*) scriptorial or directive, comprising (3) coördinative, and (4) inventive thought ; and perhaps (*C*) superscriptorial or (5) creative mind-work ; and it would appear that no thinker in any stage or sub-stage can comprehend the thinking of any higher plane, or fully assimilate that of any lower plane. These principal stages and sub-stages are themselves made up of local and temporary phases of thinking too many for enumeration—indeed as many as there are distinct peoples ; yet all these appear to fall naturally into groups corresponding to the stages outlined.

When the culture-grades, or planes in cultural development, are thus defined, it becomes easy to understand the various ways in which different minds respond to given stimuli, and, at the same time, to weigh such activital coincidences as occasionally arise ; it also becomes easy to discriminate the effects of the external and internal factors of thought, that is, the effects of

environment on the one hand and of heredity plus individual initiative on the other hand. For, other things equal, each mind responds according to its culture-status, considered as the resultant of heredity and initiative, so that most minds of given grade will tend to respond alike to like stimuli; yet the same mind may be so far dominated by environing conditions as to respond in particular directions according to somewhat higher or lower grades, rather than to that in which it properly belongs. But this is the special case; in general the recorded activital coincidences pertain to corresponding planes of thought coexisting independently among unrelated peoples.

On reviewing the trend of psychic progress, it is found to attend that somatic progress marked by cephalization and cheirization with such degree of closeness that the mental power of an ethnos or demos may be measured by the size of the average brain and the dexterity of the average hand; yet the sum of mental faculty appears to augment in more than a simple ratio with brain-growth and hand-development. The review also reveals a law of cumulation of knowledge, though present data do not warrant a quantitative formula; at the same time, it serves to elucidate certain puzzling activital coincidences, and to indicate the relative importance of resemblances and differences in mode of thinking. Finally, the review verifies and corroborates the testimony of lines of blood, and brings out the multiplicity of original streams of mentality, streams constantly blending and gaining strength by union.

So the general view of the volume of human experience concerning human mentality affords ample data for determining the general course of the current: it indicates that the sum of knowledge is increasing cumulatively, that thought is extending from man to man and from group to group and gaining force with each extension, and that all lines converge toward a plane higher than any yet attained.

Demonomy

The somatikos, with its dominant cerebral organ, is the mechanism of the human activities and at the same time an essential constituent of the collective human unit. While the human groups are many and diverse, they are conveniently combined in two categories: first, the natural or consanguineal or kinship group in which the unit is the ethnos; and second, the artificial or essentially social group in which the unit is the demos. The ethnos, or ethnic group, is the homologue of the varietal or specific group of animals; it is the dominant group in lower savagery, but its influence on human life wanes upward, to practically disappear in enlightenment except as retained in the structure of the family. The demos is the product of intelligence applied to the regulation of human affairs; it has no true homologue among animals; its importance waxes as that of the ethnos wanes from savagery through barbarism and civilization and thence into enlightenment.

The nature of the human activities in every stage is affected by the degree of development from the primeval ethnic condition toward the more advanced demotic condition; yet so many of the lines of human activity arose in the ethnic stage (to subdivide and ramify later) that the classification of activities must be broad enough to comprehend the two primary categories of collective units. At the same time, since the activities gained typical development only in the demotic condition; and, since their classification is framed especially to fit that higher condition, it is appropriate to characterize the activities as demotic, and to combine them in a system already known as Demonomy.

Five great groups of activities have been defined, and each of these has been arranged as the object-matter of a special science. The activities and special sciences are (1) activities giving pleasure, or arts: Esthetology; (2) activities promoting welfare, or industries: Technology; (3) activities uniting men, or institu-

tions: Sociology; (4) activities expressing thought, or languages: Philology; (5) activities for organizing knowledge, or philosophies: Sophiology. These activities and sciences have already been defined at length¹; accordingly nothing more than a brief outline of the sciences, with special reference to trend of activital development, seems now to be required.

Esthetology.—The pleasurable activities appear to arise normally with an exuberance proportionate to intelligence; and in demotic organization they appear to pass from person to person and from group to group, in a contagion beginning in appreciation and maturing in imitation, with a degree of rapidity also varying directly with intelligence. The conspicuous feature of the pleasure instinct, as expressed in individual experience and in the records of tradition and literature, is the constant out-reaching from the commonplace into the ideal, or the novel, or at least the unusual—that is, the key-note of the instinct is the insatiable hunger of humanity for better things. So the savage eye is caught by the gleam of the stars, by the glory of the sun, by the glitter of the gem, by the glint of light from distant peak or lake, as well as by brilliant color and definite shape; and his crude ideas are laxly spun into a pervasive mythology or more closely woven into growing concepts of grace and beauty. So, too, the barbaric eye is caught by the brilliant and remote, and idealization grows apace in the expanding mind, while the highly cultured harmonize colors and forms, and reach out among other races and nations for new motives; and in each stage the other sense organs combine with the eye in finding fresh ideals and bringing them into the permanent possession of the group. Now, the pleasure instinct, like all other things human, grows by exer-

¹ Vice-presidential address before the Anthropological Section of the American Association for the Advancement of Science, entitled "The Science of Humanity" (*Proceedings of the A. A. A. S.*, vol. XLVI, 1897, pp. 293-324; *American Anthropologist*, vol. x, 1897, pp. 241-272; *Science*, vol. vi, 1897, pp. 413-433, and *Scientific American Supplement*, vol. XLIV, 1897, pp. 18068-18070, 18083-18084, and 18121); also in the *Sixteenth Annual Report of the Bureau of American Ethnology*, 1897, pp. xv-xviii.

cise (save where sporadically suppressed by inaction) to the extent that each generation enjoys a richer heritage than any that went before, so that pleasure increases cumulatively, under a law no less definite than that general law of cumulation of knowledge of which it is a special expression. Man may be defined as the animal who laughs; it was with the advent of his kind that smiles and laughter came to be on earth; but the instinct and the means of happiness have continued to multiply with the passing generations, and to spread from people to people in a lightsome leaven permeating the primevally leaden lump with the natural germs of sympathy and affection; and in civilization and enlightenment the instrumentalities of pleasure are increased and multiplied to a number and potency hardly less than those of material welfare.

It is the property of pleasure to spring spontaneously in the human mind and to spread irrepressibly by normal impulse, the most powerful in human faculty; it is the quality of pleasure to warm sympathy and enkindle unity, and thus to prepare the way for the blending first of culture and then of blood throughout the realm of humanity; and the efficiency of pleasure, like that of the other activities, increases progressively with the cumulative growth of human knowledge.

Technology.—The industrial activities are the pillars of individual and collective welfare; they are manifestly inherited from a lowly ancestry, whose representatives sought food and shelter for self and kind with an avidity sharpened into cunning and refined into intelligence as the generations passed; yet, with the growth of intelligence in the human realm, the activities have ramified widely and risen to new planes far above the reach of the beast. Primarily, industries and pleasures are antithetic, since the former pertain especially to the ego, while the latter spread spontaneously from the ego outward; the activities of the one class are essentially centripetal, those of the other essentially centrifugal; the initial tendency of the indus-

tries is egoistic, that of the pleasures altruistic. Despite this primary distinction (pertaining especially to the progenitors, among whom pleasures must have been far subordinate), industries acquired a collective character even among the brutes, for, under the law of survival, maintenance of self grows into maintenance of kind ; while in the realm of humanity it is the tendency of industries, vitalized as they are, at every stage by the pleasures of life, to extend from self to family, thence to tribe and nation and race, and finally to the sum of human kind as successively larger and larger groups are united by common interests, common sympathies, and common knowledge. The key-note of industrial activity is hunger for material things ; not necessarily better things, save as the instinct is brightened by the pleasure-instinct, yet for things good enough to maintain life and comfort. The early method is half-desperate essay or experiment, which guides future essay by its success or failure ; a later method, pursued alike by beasts and lower men, is more hopeful essay guided by experience of others, and this matures in that imitation so characteristic of early culture and so influential in harmonizing tribe with tribe and nation with nation ; the final method is confident essay under the guidance of both individual and collective experience (that is, the sum of available knowledge) along the lines involved—and this matures in invention, the highest expression of industrial activity. Hence, at first egoistic and centripetal, the industries of humanity tend constantly to pass under the domain of knowledge, to share its cumulative growth, and in time to become pleasurable altruistic and centrifugal ; and, in so far as they are controlled by knowledge, the industries become collective bonds, uniting men and nations, extending throughout the world, and gaining strength from generation to generation with the growth of human faculty.

So the function of industry is the maintenance of individual and collective life ; its quality is first intensive, then extensive, and at last comprehensive ; and its effect is to strengthen faculty

by exercise, and to extend and finally unite interests throughout the realm of humanity.

Sociology.—The institutions of human kind express that collectivity which demarks man most clearly from the brute. True, their germs bud in the subhuman family, as among the oranges and gorillas, whose family-group comprises a male protector and a female supporter of their own young; yet they expand cumulatively with the upwelling of the esthetic and the extension of the industrial, as well as with other factors involved in the growth of knowledge. The primary institutional bond appears to reside in maternal instinct, which is warmed by survival into a lax super-organic mechanism for the maintenance of kind through the nurture and protection of the young, and eventually grows by the survival of the affectionate and far-sighted into the maternal family-group or clan, in which the basis of organization is kinship traced in the female line; for it is not until knowledge has risen a long way up the genealogic tree of human development that the full meaning of the spasmodic pairing instinct is grasped and finally fixed by fully recognized paternity. With the enlargement of the family-group, the need for common protection arises and is met by spontaneous and mutual selection of leaders, and thus another institutional bond is woven; as the group enlarges and subdivides through the exigencies of food-quest or strife, sub-leaders are similarly chosen, and the idea of chiefship determined by prowess and shrewdness is developed; and eventually each individual in the group learns his or her place in the perfected hierarchy into which the group is forced by the interminable struggle between its own collective vitality and the great external. Commonly the incipient governmental organization is strengthened by differentiation of function, especially into warrior-protectors, who are generally males, and more plodding food-producers, who are generally females—though the domestic control is vested largely or wholly in the mothers of the groups until paternity is recognized. Another factor, born of the ceaseless

stress of fear on budding intelligence environed by infinite sources of tragedy, is an umbrage of mystery illumed only by the feeble light of actual knowledge at the center of the cloud investing lower man ; as time passes the mystery is analyzed in terms of his small knowledge, and vaguely formulated as a hierarchy of mysteries, at first maleficent all but gradually becoming beneficent in part as his growing experience makes way for conquest over the erstwhile terrible unknown. Naturally some thinkers lead in forcing the environing mysteries, and are spontaneously chosen as chiefs of mystical craft ; their function is to confront and conquer for the weal of their group the dim-peopled shadows of dark imagining ; and in many tribes they are organized in a hierarchy of shamans often equal and sometimes far superior in power to the temporal hierarchy of civil chiefs. It is the duty of the shaman to encompass knowledge mystically, and the duty of the warrior and food-finder to encompass facts experimentally ; and as knowledge develops under its cumulative law the mystery of paternity is solved, and the savage gains a new hold on the forces shaping his own career. Thenceforth the family organization becomes paternal, and savagery grows into barbaric culture. Scripture teaches that this type of culture grew into a patriarchal-priestly organization, and that under its beneficent influence population multiplied, raising problems of territorial tenure ; classic history teaches that the territorial factor grew into a priestly cult represented by the god Terminus and the sacred landmark ; while analysis of thought teaches that the conception of personal property-right necessarily awakened the idea of the correlative right of the neighbor—and the maturing concept found sacerdotal expression in the cult of Palestine, which quickly illumed the world, revolutionizing narrower institutions and marking the birth of civilization. The recognition of material right was followed in due course—albeit two millenniums later—by growing recognition of intellectual right ; and another era in institutional progress began with the inauguration of gov-

ernment of the people by the people for the people. Thus, four stages in demotic development seemed to be clearly defined: (1) Savagery, with clan and tribal organization based on kinship traced in the female line, dominated by mysticism and shamanism; (2) Barbarism, with gentile institutions based on kinship traced in the male line, dominated largely by priestcraft; (3) Civilization, with national organization based on property-right, (especially territorial), initiated and controlled by a beneficent cult; (4) Enlightenment, with national institutions based on material and intellectual rights and the recognition of individuality. Throughout, the key-note of institutional activity is hunger for association for mutual pleasure and welfare; the primitive method is biotic association for the preservation of the kind; the higher and essentially human method is combination in ever increasing groups, with the ancillary exaltation of strength and knowledge, and growing recognition of the value of life. The main lines of progress are easily traced; the early law of might yields gradually to the higher law of right; hereditary despotism gives way to popular will; knowledge passes from the mystical to the real; tribes grow into nations, and nations into alliances; judgment is strengthened by exercise, and life grows easier and happier as needless bonds are broken and as equality blossoms neath liberty's rays.

So the function of the institution is the control and regulation of individual activity for the benefit of the group; and the quality of the institution is at first kindly and at last charitable. The tendency of the institution is to expand with the extension of pleasures and industries; and its effect is to combine humanity in larger and larger groups as the generations pass, yet ever to lighten its own chains with the growth of individual knowledge and kindliness.

Philology.—Language appears to arise spontaneously among the brutes in the form of inarticulate cries of fright or pain, or perchance expressing the mere joy of living or the glory of virile

strength ; but even in the lowest known examples of humanity, vocal utterance is articulated, differentiated into phonetic forms, diversified lexically and structurally, and supplemented by pantomimic or graphic devices or by both. Commonly the languages of the more primitive living groups express ideas in terms of egocentric association, as in the kinship terminology which expresses relative position or rank throughout the group, while the languages of the higher groups are commonly richer and more definite in vocabulary, and more or less devoid of associative connotation and structure ; so that it seems fair to measure linguistic growth by the development of words as definite symbols of discrete ideas, and by the concomitant elimination of inflexional and other associative devices. The sematic simplification of language is coupled with that phonetic simplification (the effect of intuitive economization) which distinguishes all higher tongues from lower—e. g., a highly developed language may be written phonetically in an alphabet of some forty characters or less, and all the strong modern languages may be written in twice as many, while it has been estimated (by Dorsey) that the aboriginal American languages would require three hundred or more characters for adequate phonetic expression.

The primary function of language is the transmission of ideas, at first vague but ever increasing in definiteness with growth of knowledge, so that the quality of language is essentially collective ; under primitive conditions the linguistic tie may be limited largely to the family-group, though the analogy of the singing bird and roaring beast suggests a mating-motive extending the vocal function from family to family in ever widening circles—certainly the vocal tie of savagery and barbarism warms into the most delicate and significant of intertribal bonds, bonds eventually fixed by endogamic and exogamic regulations and limited by community of faith. The vehicle of thought in every stage of development, language reacts on the mind and gives final shape to thought, howsoever rough-hewn ; thus it is the

effect of language to harmonize opinions, to bring individuals and groups into closer accord, to integrate pleasures and industries and institutions and, in the last analysis, to unify mankind.

Sophiology.—In every stage of human development, current knowledge is synthesized in the form of philosophies, or systems of opinion or belief; initially the act of synthesis seems to be normal and spontaneous as youthful playfulness, an expression of hunger for better things intellectual; later the instinct is controlled by the products of its own activity, much as pleasures are regulated by the devices involved in the pursuit of pleasure. In each stage, current philosophy conforms to the fundamental law of knowledge; by reason of its spontaneous quality it upwells and expands constantly, like its offshoot plant of poesy that doth feed upon itself; by reason of its function as the synthetic bond and essence of the simpler activities, it spreads from man to man and from group to group, steadily eliminating its own incongruities through the attrition of contact; by reason of its natural tendency to follow the paths of least resistance, it serves to bring mental operations into conformity with the processes of nature, and eventually to exalt the mind of man to its true place (so clearly seen by Bacon) as first the mirror and then—as passive coördination grows into forceful coördination—the master of nature; and by reason of its tendency toward diffusion, synthesized knowledge tends to combine men and groups in ever larger and more sympathetic units, and so to unify humanity.

The demotic activities in general.—When the several human activities are scanned separately, their tendencies are easily traced; all diverge in form, yet converge in essential quality and in their effects on mankind; and when the several categories of activities are juxtaposed their trend is still more clearly displayed—for all the main lines are convergent. Comparison between the lines of human progress and the lines of biotic evolution is especially significant, since the essentially biotic lines diverge toward infinite differentiation, while the essentially human lines converge toward

union; and herein appears to lie the break between the biotic realm and the human realm, as seen from the standpoint of the phylogenist. Comparison of the activital lines with the lines of psychic development is even more instructive, since the trend is similar; and this correspondence seems at once to define the realm of humanity as coincident with the domain of intellectuality, and to extend the law of the cumulation of knowledge over the entire range of the human activities. Under this view, human faculty is seen to transcend the realm of the inorganic, no less completely than the realm of the biotic, in that its fundamental character rises above the mere indestructibility of matter, even above the simple persistence of motion, in a law of cumulative growth; yet it were but mental atavism to invest this law with mystery, or do else than seek to formulate it in quantitative terms.

The convergent trend of each and every series of human activities bears directly on the much-discussed question of the origin of the genus *Homo*. It cannot be affirmed too emphatically that critical observations on mankind indicate convergence of somatic and psychic and demotic characters, and that no careful observations indicate divergence of the essential characters of mankind—indeed it is a commonplace fact that all the lines of human culture, like most of the lines of human blood, are blending more or less rapidly and that neither culture nor blood is becoming divergent in any part of the world. The process of blending seems to be cumulative under the law of humanity; and no shadow of warrant appears for assuming any other trend during the history of human development. It follows that the theory of monogenism is devoid of direct or indirect observational basis, and that the polygenetic theory is supported by the sum of available facts. In view of the evidence, it would appear practically certain that *Homo* came up independently from a widely distributed protohuman ancestry in at least as many centers as there are races or varieties of his genus; and the law of cumulative

growth, taken in connection with the various culture stages now existing, indicates that the transition was by no means contemporaneous—that, e. g., the progenitors of the white man must have been well past the critical point before the progenitors of the red and the black arose from the plane of bestiality to that of humanity.

The Advance of Culture

Classed in terms of blood, the peoples of the world may be grouped in several races; classed in terms of what they *do* rather than what they merely *are*, they are conveniently grouped in the four culture grades of savagery, barbarism, civilization, and enlightenment.

Considered as races, the peoples are evidently approaching community, partly through blending of blood, partly through the more rapid extinction of the lower races who lack the strong constitution (developed through generations of exercise) enjoyed by the higher races; so that the races of the continents are gradually uniting in lighter blend, and the burden of humanity is already in large measure the White Man's burden—for, viewing the human world as it is, white and strong are synonymous terms.

Still more significant is the trend of progress descried when the people of the world are considered as representatives of the four culture grades; for the lamp of civilization and the sun of enlightenment are shining on the dark-skin peoples no less strongly (albeit somewhat less effectively) than on those of white skin, and all are rising steadily into the higher grades. Even below the plane in which enlightenment is an appreciably efficient factor in shaping progress, the savage is acquiring, both spontaneously and through association, the knowledge required to raise him into the higher grade of barbarism, while the shackles of barbaric organization are slowly wearing weaker through normal processes. The 1,500,000,000 people of the world are increasing from decade to decade in number, and still more rapidly in efficiency as indi-

vidual units of humanity ; during each decade the relative increase in both directions is most rapid among enlightened citizens and decidedly slower among civilization's subjects, while the barbarians gain little if any and the savages lose ; during each decade the gain of the higher grades and the loss of the lower may be traced partly to the longer life of the better-cultured, partly to the advance of lower people into the higher grades ; and during each decade average viability and average intelligence, as well as average population, are increased—and when the decades are compared, the increase is found to be cumulative, so far as the figures are trustworthy.

So when human experience concerning human blood and human culture is synthesized, and when the sum is analyzed into its simplest elements, a single trend is seen : The blood of the races is blending slowly, yet with steadily increasing rapidity, while the culture of the world is blending still more rapidly than the blood ; the blood-blending may be sometimes injurious, though it is more frequently beneficial, while the culture-blending is rarely followed by deterioration of the better, commonly attended by improvement of the worse ; and human culture is becoming unified, not only through diffusion but through the extinction of the lower grades as their representatives rise into higher grades.

Such seems to be the Trend of Human Progress.